

### REMARKS

In the Office Action dated October 16, 2002, claims 6 and 7 stand rejected under 35 U.S.C. §112, second paragraph. Claims 1, 2, 4, 6 and 8-10 stand rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 4,443,551 to Lionetti et al. (hereinafter "Lionetti"). Claims 3, 5, 7 and 11 stand rejected under 35 U.S.C. §103 as obvious over Lionetti in view of U.S. Patent No. 3,763,380 to Robinson et al. (hereinafter "Robinson").

In response, Applicants have cancelled claims 8-11, amended claims 1-7, and added claims 12-25, which when considered with the remarks set forth below are deemed to place the application in condition for allowance. Claims 1-7 and 12-25 are presented for continued prosecution. Reconsideration of the application is respectfully requested.

Applicants respectfully submit that the amendment of claims 1-7 and the addition of claims 19-25 do not introduce new matter. For example, claim 1 has been amended to now recite a fluid bed furnace or reactor incorporating the gas distributor of the invention. Support is found in Figures 4 and 7 in addition to the specification. Claims 2 and 3 have been amended to improve syntax. Claims 4 and 5 have been amended to claim metal parts and metal castings to be used in conjunction with the fluid bed furnace/reactor of the invention. Support for metal parts and metal castings have sand cores is found in the "Field of the Invention" at page 1, lines 1-8 of the specification. In addition, support for the addition of method claims (i.e., claims 12-25) is also found in the "field of the Invention."

#### Rejection under 35 U.S.C. §112, Second Paragraph

Claims 6 and 7 stand rejected as being vague and indefinite since the Examiner finds unclear how the gaseous fuel of claims 4 and 5 can be a liquid fuel. In view of the amendment of

claims 6 and 7, this issue is now considered moot. Withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. §102(b)

Claims 1, 2, 4, 6 and 8-10 stand rejected as anticipated by Lionetti. The Examiner contends that Fig. 1 of Lionetti discloses a distributor in a fluid bed reactor comprising a gas phase piping array discharging into a fluid bed of solids through a plurality of tuyeres coupled to and mounted beneath the piping array.

In view of the cancellation of claims 8-10, the rejection of these claims is now considered moot. Accordingly, Applicants respond only to the rejection of claims 1-2 and 4-6.

Applicants submit that Lionetti does not disclose the gas distributor of claim 1, as filed. Specifically, claim 1, as filed requires that the tuyeres be mounted and coupled below the piping array so that the granular solids are fluidized as a “vertical elevation.” In order to do so, the tuyeres are inherently in a vertical elevation as shown in Figure 4. Claim 1, as amended, more clearly recites this orientation (i.e., the vertical elevation) of the tuyeres. Thus, the tuyeres are perpendicular to the piping array, which is clearly shown in Figure 4. To the contrary, Lionetti specifically discloses the tuyeres of its piping array being angled in the range of 30° to 75°. Consequently, Lionetti does not disclose the vertical elevation of the tuyeres of the present invention and does not anticipate claims 1-2 and 4-6. In addition, Lionetti does not disclose, teach or suggest metal parts or metal castings as required by claims 4 and 5, respectively. Withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. §103

Claims 3, 5, 7 and 11 stand rejected as obvious over Lionetti in view of Robinson. Specifically, the Examiner contends that while Lionetti is silent on providing a heat exchanger to

the fluid bed furnace, Robinson discloses a heat exchanger above the distribution ports and submerged in the fluid bed. Thus, the combination of Lionetti and Robinson renders claim 3 obvious. Claims 5, 7 and 11 are also considered obvious since the Examiner contends that these claims do not add any structural limitation.

In view of the cancellation of claim 11, the rejection of this claim is considered moot. Accordingly, Applicants respond only to the rejection of claims 3, 5 and 7.

Applicants respectfully submit that claims 3, 5 and 7 are not rendered obvious by Lionetti and Robinson since the combination does not set forth a *prima facie* case of obviousness against claim 1. Claim 1 requires that the tuyeres have a vertical elevation. However, Lionetti and Robinson fail to teach or suggest this element of claim 1. Moreover, claim 5 now requires metal castings with sand cores to be in the bed. Withdrawal of the rejection is respectfully requested.

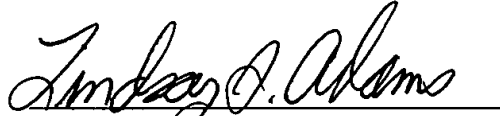
In view of the above, Applicants respectfully submit that the application is in condition for allowance, which action is earnestly solicited. If the Examiner has any questions regarding the amendment, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number set forth below.

Applicants do not believe that any fees, other than the requisite fee for the two month extension of time, are due with this amendment. However, if any additional fees are due, please charge such sums to our Deposit Account, 50-1145.

A marked-up version of the changes made to the application is attached hereto as an appendix. In the marked-up version, the words bracketed are being deleted and those underlined are being added by the amendment, which places the amended language in the form given above.

The attached appendix is captioned VERSION WITH MARKINGS TO SHOW CHANGES  
MADE.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Lindsay S. Adams", is written over a horizontal line.

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

1. (Amended) A [gas phase distributor in a] fluid bed reactor or furnace comprising a fluid bed reactor or furnace with a gas phase distributor including a gas phase piping array discharging into a fluid bed of granular solids through a plurality of tuyeres [which are] coupled to and mounted beneath the piping array in a vertical elevation such that the granular solids below the piping array are fluidized [at a vertical elevation below the piping array] thereby causing [elevated temperature] the fluidizing gas in the piping array to indirectly heat the fluidized bed [through the piping array] prior to entering the fluidized bed through the tuyeres.

2. (Amended) The fluid bed reactor or furnace [gas phase distributor] of claim 1, wherein the gas phase distributor [the] discharges the fluidizing gas [from the piping array is] through openings or ports in a bottom portion of the piping array.

3. (Amended) The fluid bed reactor or furnace [gas phase distributor] of claim 2, wherein the gas phase distributor further comprises [comprising] a heat exchanger in a feed line to the gas phase distributor such that the heat exchanger location is above [a vertical elevation of] the fluidizing gas distribution ports and submerged in the fluidized solids, thereby permitting indirect heat transfer from [elevated temperature] the fluidizing gas prior to the gas phase distributor [so as to transfer energy to fluidized solids prior to entering the fluidized bed through the gas distributor ports].

4. (Amended) The fluid bed reactor or furnace [gas phase distributor] of claim 1, further comprising metal parts in the fluid bed of granular solids [wherein gaseous fuel is combusted with air to achieve high temperature combustion gas products, which is fed through the piping array in the fluid bed furnace transferring energy through the piping array to the fluid bed furnace thereby lowering the temperature of the gas discharging through the tuyeres into the fluidized bed].

5. (Amended) The fluid bed reactor or furnace [gas phase distributor] of claim 3, wherein further comprising metal castings with sand cores in the fluid bed of granular solids [gaseous fuel is combusted with air to achieve high temperature combustion gas products, which is fed through the piping array in the fluid bed furnace transferring energy through the piping array to the fluid bed furnace thereby lowering the temperature of the gas discharging through the ports into the fluidized bed].

6. (Amended) The fluid bed reactor or furnace [gas phase distributor] of claim 4, wherein the metal parts are of aluminum [where the fuel is a liquid fuel].

7. (Amended) The fluid bed reactor or furnace [gas phase distributor] of claim 5, wherein the metal castings are of aluminum [where the fuel is a liquid fuel].